

I claim:

- 1 1. An article comprising:
2 a fluid reservoir having a plurality of chambers and a non-compartmentalized region
3 overlying said chambers;
4 a plurality of valves operable to receive and controllably dispense sub-milliliter
5 quantities of at least one fluid stored in said chambers; and
6 a plurality of fluid-delivery conduits that place said chambers and said valves in fluid
7 communication.
- 1 2. The article of claim 1 wherein said fluid-delivery conduits have a length that
2 is less than about one centimeter.
- 1 3. The article of claim 1 further comprising a plurality of ports for individually
2 filling said chambers.
- 1 4. The article of claim 1 wherein said valves are tiltable relative to a vertical
2 axis.
- 1 5. The article of claim 1 wherein said plurality of valves are received by a
2 valve-support member.
- 1 6. The article of claim 5 wherein:
2 said valve-support member has a first elongate hole and a second elongate hole, said
3 first and second elongate holes having a long axis aligned in a first direction; and
4 said valve support member is attached to a positioning member at a third elongate
5 hole and at a fourth elongate hole of said positioning member, said third and fourth elongate
6 holes having a long axis aligned in a second direction;
7 wherein:
8 said first direction is orthogonal to said second direction; and
9 said valve-support member is movable in said second direction along said
10 long axis of said third and fourth elongate holes.

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1 7. The article of claim 6 wherein said valve-support member is movable in said
2 first direction along said long axis of said first and second elongate holes.

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1 8. The article of claim 6 further comprising a longitudinal positioner that is
2 operable to move said valve support member in a third direction that is orthogonal to said first
3 direction and orthogonal to said second direction.

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1 9. The article of claim 1 further comprising a pinch valve that is disposed in a
2 fluid-delivery conduit and is operable to affect a flow of liquid out of said fluid-delivery
3 conduit.

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1 10. The article of claim 1 further comprising a restriction orifice disposed in said
2 fluid-delivery conduit, said restriction orifice operable to admit liquid into said fluid-delivery
3 conduit at a slower rate than said liquid is dispensed through said valves.

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1 11. The article of claim 1 further comprising a dynamic pressure sensor operable
2 to sense pressure within said fluid-delivery conduit.

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1 12. The article of claim 1 further comprising a resilience-adjusting element
2 operable to adjust a resilience of said fluid-delivery conduit.

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1 13. The article of claim 12 wherein said resilience-adjusting element comprises:
2 an enclosure that defines a pressure-tight chamber surrounding at least a portion of
3 said fluid-delivery conduit; and
4 a pressure-adjustment element for changing pressure within said enclosure.

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1 14. The article of claim 1 further comprising an incremental positioner operable
2 to advance a liquid receiver beneath said plurality of valves.

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1 15. An article comprising:

2 a positioning member having a first elongate hole, said first elongate hole having a
3 long axis aligned in a first direction; and4 a multi-channel liquid dispensing head having a second elongate hole, said second
5 elongate hole having a long axis aligned in a second direction that is orthogonal to said first
6 direction;

7 wherein:

8 said positioning member engages said multi-channel liquid dispensing head via said
9 first and second elongate holes; and10 said multi-channel liquid dispensing head is movable in said first direction along said
11 long axis of said first elongate hole.

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1 16. The article of claim 15 wherein said multi-channel liquid dispensing head is
2 movable in said second direction along said long axis of said second elongate hole.

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1 17. The article of claim 16 wherein said multi-channel liquid dispensing head
2 comprises:

3 a plurality of valves; and

4 a plurality of fasteners having eccentrically disposed holes that receive said valves;

5 wherein when said fasteners are rotated, said valves tilt relative to said second

6 direction.

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1 18. The article of claim 17 further comprising a longitudinal positioner that is
2 operable to move said multi-channel liquid dispensing head in a third direction that is
3 orthogonal to said first direction and orthogonal to said second direction.

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1 19. The article of claim 17 further comprising a plurality of fluid-delivery
2 conduits that are in fluid communication with said plurality of valves, said fluid-
3 delivery conduits including at least one fluid control feature.

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1 20. The article of claim 19 further comprising a reservoir having a plurality of
2 chambers that are in fluid communication with said plurality of said fluid-delivery conduits.